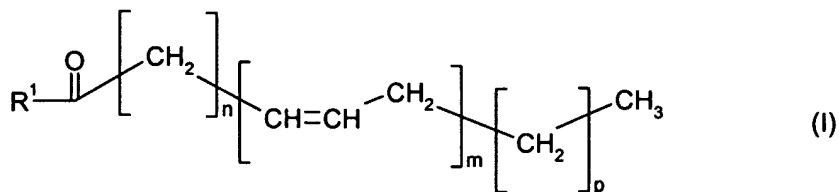


AMENDMENTS TO THE CLAIMS

1. (Original) A process for the production of compounds of the following general formula I

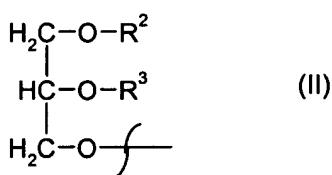


in transgenic organisms with a content of at least 1 % by weight of said compounds - referred to the total lipid content of said organism which comprises the following steps:

- a) introduction of at least one nucleic acid sequence in a transgenic organism, which encodes a Δ -9-elongase, and
- b) introduction of at least one second nucleic acid sequence which encodes a Δ -8-desaturase, and
- c) if necessary introduction of at least a one third nucleic acid sequence, which encodes a Δ -5-desaturase, and
- d) cultivating and harvesting of said organism; and

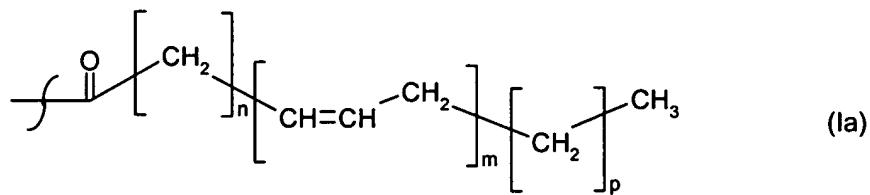
where the variables and substituents in formula I have the following meanings:

R^1 = hydroxyl-, Coenzyme A-(Thioester), phosphatidylcholine-, phosphatidyl-ethanolamine-, phosphatidylglycerol-, diphosphatidylglycerol-, phosphatidylserine-, phosphatidylinositol-, sphingolipid-, glycosphingolipid- or a residue of the general formula II:



R^2 = hydrogen-, phosphatidylcholine-, phosphatidylethanolamine-, phosphatidylglycerol-, diphosphatidylglycerol-, phosphatidylserine-, phosphatidylinositol-, sphingolipid-, glycosphingolipid-, glycosphingolipid- or saturated or unsaturated C₂–C₂₄–alkylcarbonyl-,

R^3 = hydrogen-, saturated or unsaturated C₂–C₂₄–alkylcarbonyl-, or R^2 and R^3 independent of each other a residue of the formula Ia:



$n = 3, 4$ or 6 , $m = 3, 4$ or 5 and $p = 0$ or 3 .

2. (Original) The process as claimed in claim 1, wherein the nucleic acid sequences which encode polypeptides with Δ -8-desaturase, Δ -9-elongase or Δ -5-desaturase are selected from the group consisting of

- a) a nucleic acid sequence depicted in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7 or SEQ ID NO: 9
- b) a nucleic acid sequence which is derived from the sequence depicted in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7 or SEQ ID NO: 9 according to the degeneracy of the genetic code,
- c) derivatives of the sequence depicted in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7 or SEQ ID NO: 9 which encodes polypeptides having at least 50 % homology to the sequence encoding amino acid sequences depicted in SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8 or SEQ ID NO: 10 and which sequences function as a Δ -8-desaturase, Δ -9-elongase or Δ -5-desaturase.

3. (Currently amended) The process as claimed in claim 1 ~~or claim 2~~, wherein the substituents R² and R³ are independent of each other saturated or unsaturated C₁₀–C₂₂–alkylcarbonyl-.
4. (Currently amended) The process as claimed in ~~any of the claims 1 to 3~~ claim 1, wherein the substituents R² and R³ are independent of each other saturated or unsaturated C₁₆–, C₁₈–, C₂₀– or C₂₂–alkylcarbonyl-.
5. (Currently amended) The process as claimed in ~~any of the claims 1 to 4~~ claim 1, wherein the substituents R² and R³ are independent of each other unsaturated C₁₆–, C₁₈–, C₂₀– or C₂₂–alkylcarbonyl- with at least three double bonds.
6. (Currently amended) The process as claimed in ~~any of the claims 1 to 5~~ claim 1, wherein the transgenic organism is an oil producing plant.
7. (Currently amended) The process as claimed in ~~any of the claims 1 to 6~~ claim 1, wherein the transgenic plant is selected from the group consisting of rapeseed, poppy, mustard, hemp, castor bean, sesame, olive, calendula, punica, hazel nut, almond, macadamia, avocado, pumpkin, walnut, laurel, pistachio, primrose, canola, peanut, linseed, soybean, safflower, sunflower and borage.
8. (Currently amended) The process as claimed in ~~any of the claims 1 to 7~~ claim 1, wherein the compounds of the general formula I are isolated in the form of their oils, lipids of free fatty acids.
9. (Currently amended) The process as claimed in ~~any of the claims 1 to 8~~ claim 1, wherein the compounds of the general formula I are isolated in a concentration of at least 5 % by weight referred to the total lipid content.
10. (Original) An isolated nucleic acid sequence comprising a nucleotide sequence which encodes a Δ-8-desaturase selected from the group consisting of
 - a) a nucleic acid sequence depicted in SEQ ID NO: 1,

- b) a nucleic acid sequence which is derived from the sequence depicted in SEQ ID NO: 1 according to the degeneracy of the genetic code and which sequences function as a Δ -8-desaturase.

11. (Original) An isolated nucleic acid sequence comprising a nucleotide sequence which encodes a Δ -5-desaturase selected from the group consisting of

- a) a nucleic acid sequence depicted in SEQ ID NO: 5,
- b) a nucleic acid sequence which is derived from the sequence depicted in SEQ ID NO: 5 according to the degeneracy of the genetic code,
- c) derivatives of the sequence depicted in SEQ ID NO: 5 which encodes polypeptides having at least 50 % homology to the sequence encoding amino acid sequences depicted in SEQ ID NO: 6 and which sequences function as a Δ -5-desaturase.

12. (Currently amended) An amino-acid sequence encoded by an isolated nucleic acid sequence as claimed in claims 10 ~~or claim 11~~.

13. (Currently amended) A gene construct comprising an isolated nucleic acid having the sequence SEQ ID NO: 1 ~~or SEQ ID NO: 5~~ as claimed in claim 10 ~~or claim 11~~, where the nucleic acid is functionally linked to one or more regulatory signals.

14. (Original) A gene construct as claimed in claim 13, whose gene expression is increased by the regulatory signals.

15. (Currently amended) A vector comprising a nucleic acid as claimed in claim 10 ~~or claim 11 or a gene construct as claimed in claim 14~~.

16. (Currently amended) An organism comprising at least one nucleic acid as claimed in claim 10 ~~or claim 11, a gene construct as claimed in claim 13 or a vector as claimed in claim 15~~.

17. (Original) The organism as claimed in claim 16, wherein the organism is a microorganism, a non-human animal or a plant.
18. (Currently amended) The organism as claimed in claim 16 ~~or 17~~, wherein the organism is a transgenic plant.
19. (New) An amino-acid sequence encoded by an isolated nucleic acid sequence as claimed in claim 11.
20. (New) A gene construct comprising an isolated nucleic acid having the sequence SEQ ID NO: 5 as claimed in claim 11, where the nucleic acid is functionally linked to one or more regulatory signals.
21. (New) A gene construct as claimed in claim 20, whose gene expression is increased by the regulatory signals.
22. (New) A vector comprising a nucleic acid as claimed in claim 11.
23. (New) An organism comprising at least one nucleic acid as claimed in claim 11.
24. (New) The organism as claimed in claim 23, wherein the organism is a microorganism, a non-human animal or a plant.
25. (New) The organism as claimed in claim 23, wherein the organism is a transgenic plant.